

**WHAT IS CLAIMED IS:**

1. A method comprising:  
determining if servicing a consume request for a resource would cause a  
threshold rate that corresponds to the requested resource to be  
exceeded; and  
if the threshold would be exceeded, then delaying servicing of the request for  
at least a period of time sufficient to avoid exceeding the threshold.
2. The method of claim 1 wherein a first isolate resolves a trigger that  
determines if the threshold rate would be exceeded and delays servicing of the  
request, wherein the first isolate is a set of one or more computations that have a state  
independent of other computations and that monitor and control resource requests for  
the resource separate from the implementation of the resource.
3. The method of claim 2 wherein the first isolate monitors and controls  
resource requests based at least in part on a set of common attributes characterizing  
the resource, wherein the set of attributes include disposable, revocable, reservable,  
and bounded.
4. The method of claim 2 wherein the trigger is specified by a second isolate.
5. The method of claim 4 wherein the second isolate installs the trigger in a  
resource domain and the first isolate determines the trigger from the resource domain,  
wherein the resource domain includes an encoding that associates one or more  
resource policies with resource consuming isolates.
6. The method of claim 1 wherein the threshold rate indicates a maximum  
allowable resource usage by a particular resource consumer within a given interval.
7. The method of claim 6 wherein resource consumer includes client, isolate,  
process, and application.

8. The method of claim 6 further comprising recording previous consume requests from the consumer.

9. The method of claim 1 further comprising recording previously consumed amounts of the resource.

10. The method of claim 9 further comprising purging those recorded previously consumed amounts of the resource that fall beyond the given interval.

11. The method of claim 9 wherein determining comprises:  
determining a current usage of the requested resource;  
determining a potential usage of the resource based at least in part on the  
consume request;  
determining previously consumed amounts of the resource within a given  
interval from the recorded previous consumed amounts; and  
determining if threshold rate will be exceeded based at least in part on the  
current usage, the potential usage, and the previously consumed  
amounts of the resource.

12. The method of claim 11 wherein determining if the threshold rate is exceeded is in accordance with the following, wherein previously consumed amounts indicates the amount of resource previously consumed within the given interval:

$$\text{amount\_over\_threshold} = \text{potentialusage} - \text{currentusage} + \text{previouslyconsumedamount} - \text{threshold}.$$

13. The method of claim 12 wherein the period of time is determined with the following:

$$\text{period\_of\_time} = (\text{amount\_over\_threshold} / \text{threshold}) * \text{interval}.$$

15. The method of claim 1 wherein delaying servicing of the request comprises sleeping for the period of time.

16. The method of claim 1 wherein determining if the threshold rate is exceeded comprises:

determining a rate of requests from a particular resource consumer; and  
comparing the rate of requests against the threshold rate, wherein the threshold  
rate indicates a maximum number of allowable requests for a resource  
within a given interval.

17. The method of claim 16 wherein determining the rate of requests  
comprises:

determining a number of requests received from the particular resource  
consumer over the given interval.

18. The method of claim 1 embodied as a computer program product encoded  
in one or more machine-readable media.

19. A method comprising:  
managing consume requests for a resource; and  
throttling the consume requests to conform to a threshold.

20. The method of claim 19 wherein throttling the consume requests  
comprises delaying those consume requests that would cause the threshold to be  
exceeded.

21. The method of claim 20 wherein delaying comprises sleeping for a period  
of time.

22. The method of claim 19 further comprising:  
determining a current usage, a potential usage, and a previously consumed  
resource amount within an interval.

23. The method of claim 22 wherein the period of time is determined in  
accordance with the following:

$$\text{amount\_over\_threshold} = \text{potentialusage} -$$
$$\text{currentusage} + \text{previouslyconsumedamount} - \text{threshold}; \text{ and}$$
$$\text{period\_of\_time} = (\text{amount\_over\_threshold} / \text{threshold}) * \text{interval}..$$

24. The method of claim 19 wherein threshold includes threshold consumed resource amount, threshold resource consumption rate, threshold number of resource consume requests, and threshold consume request rate.

25. The method of claim 19 wherein a dispenser isolate manages resource requests, wherein isolates includes a set of one or more encapsulated computations with state independent of other computations.

26. The method of claim 25 wherein the dispenser isolate resolves a trigger to throttle requests.

27. The method of claim 26 wherein the trigger is specified by a second isolate.

28. The method of claim 27 wherein the second isolate installs the trigger in a resource domain, wherein the resource domain includes one or more encodings that associate resource policies for the resource and computations that consume the resource.

29. The method of claim 19 embodied as a computer program product encoded in one or more machine-readable media.

30. A computer program product encoded on one or more machine-readable media, the computer program product comprising:

- a posting facility code that posts consume requests for resources;
- a rate control code that delays resource consume requests that will cause a threshold to be exceeded.

31. The computer program product of claim 30 wherein the posting facility code is based at least in part on a dispenser class, wherein the dispenser class defines an intermediary set of one or more computations that monitor and control resource requests.

32. The computer program product of claim 31 wherein the rate control code is based at least in part on a trigger class, wherein the trigger class defines one or more computations that query existence of at least one condition based at least in part on usage of a given resource.

33. The computer program product of claim 30 wherein threshold includes threshold consumed resource amount, threshold resource consumption rate, threshold number of resource consume requests, and threshold consume request rate.

34. The computer program product of claim 30 wherein the rate control code invokes a sleep computation to delay resource consume requests.

35. The computer program product of claim 34 wherein the rate control code that further determines a current resource usage, a potential resource usage, and a previously consumed resource amount within an interval.

36. The method of claim 35 wherein a period of time that the sleep computation is invoked is determined in accordance with the following:

amount\_over\_threshold=potentialusage-  
currentusage+previouslyconsumedamount-threshold; and  
period\_of\_time=(amount\_over\_threshold/threshold)\*interval.

37. A computer program product encoded on one or more machine-readable media, the computer program product comprising:

a first sequence of instructions to determine if servicing a consume resource request will cause a threshold to be exceeded; and  
a second sequence of instructions to determine a period of time to delay the request to avoid exceeding the threshold.

38. The computer program product of claim 37 wherein threshold includes threshold consumed resource amount, threshold resource consumption rate, threshold number of resource consume requests, and threshold consume request rate.

39. The computer program product of claim 37 wherein the period of time to delay the request is based at least in part on a currently used amount of the resource, a potentially used amount of the resource based on the resource request, a previously consumed amount of the resource, a time interval, and the threshold, wherein the previously consumed amount of the resource indicate the amount of previously consumed resource within the interval.

40. The computer program product of claim 39 wherein the period of time is determined according to the following:

$$\text{amount\_over\_threshold} = \text{potentialusage} - \text{currentusage} + \text{previouslyconsumedamount} - \text{threshold}; \text{ and}$$

$$\text{period\_of\_time} = (\text{amount\_over\_threshold} / \text{threshold}) * \text{interval}.$$

41. The computer program product of claim 37 wherein delaying the request comprises sleeping.

42. An apparatus comprising:

system memory; and

means for throttling resource requests to comply with a threshold, which corresponds to a resource.

43. The apparatus of claim 42 wherein threshold includes threshold consumed resource amount, threshold resource consumption rate, threshold number of resource consume requests, and threshold consume request rate.

44. The apparatus of claim 42 further comprising means for determining if the threshold will be exceeded.

45. The apparatus of claim 42 wherein the resource is characterized by a set of attributes that are common across different resources.

46. The apparatus of claim 42 wherein the set of attributes include disposable, revocable, reservable, and bounded.